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| EXAMINER |
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MIRZA, ADNAN M

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2445

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ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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DETAILED ACTION

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-11,44-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blumenau (6,195,703) and further in view of Muller et al (U.S. 5,909,686).

As per claims 1,44 Blumenau disclosed apparatus for providing high-performance, scaleable data processing and storage services to a client from a plurality of resources, comprising an access interface module which receives from the client data storage requests, each including (col. 12, lines 26-33), data object to be stored and a data object identifier that identifies that data object and in response to each storage request and based on a workload and on relative demands placed on subsets of the plurality of storage devices instead of a physical location of each of the plurality of storage devices dynamically selects a subset of the plurality of storage devices in which the data is transferred to be stored and so that data corresponding to the same data identifier can be transferred to different physical storage device locations from request to request in order to dynamically distribute the workload across the plurality of device (col. 2, lines 5-21); One ordinary skill in the art at the time of the invention knows that "routing information based on the loading characteristic of the storage access request received

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at the switch inputs in order to balance loading of the storage access requests upon the outputs of the switch” is prime example of load balancing, Where the routing information is based on the loading characteristic of the meaning workload of the memory.

However Blumenau fails to disclose a switch fabric for temporarily connecting the access interface module to the selected subset of the plurality of storage devices so that the data can be transferred to the selected subset of storage devices.

In the same field of endeavor Muller discloses, The switch fabric includes a memory access interface configured to arbitrate accesses to a forwarding database memory. The switch fabric also includes a search engine couple to the memory access interface and to engine coupled to the memory access interface and multiple input ports. The switch fabric includes command execution logic that is configured to interface with the processor for performing forwarding database accesses requested by the processor (col. 2, lines 18-28).

It would have been obvious to one having ordinary skill in the art at the time of the invention was made to have incorporated The switch fabric includes a memory access interface configured to arbitrate accesses to a forwarding database memory. The switch fabric also includes a search engine couple to the memory access interface and to engine coupled to the memory access interface and multiple input ports. The switch fabric includes command execution logic that is configured to interface with the

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processor for performing forwarding database accesses requested by the processor as taught by Muller in the method and system of Blumenau to make use of the switch fabric's knowledge of the low-level instructions for accessing the forwarding database.

6. As per claims 3,46 Blumenau -Muller disclosed wherein the switch fabric comprises a control switch fabric for transferring control information and a separate data switch fabric for transferring data (Blumenau, col. 2, lines 7-19).

7. As per claims 4,47 Blumenau -Muller disclosed wherein the control switch fabric is optimized for transferring control information and the data switch fabric is optimized for transferring data (Blumenau, col. 2, lines 29-41).

8. As per claims 5,48 Blumenau -Muller disclosed wherein the request for storage includes control information and data and wherein the access interface module separates the control information and the data and transfers the data to the selected subset of storage devices over the data switch fabric (Blumenau, col. 6, lines 44-53).

9. As per claims 6,49 Blumenau -Muller disclosed wherein the data switch fabric comprises a none blocking crossbar switch for data transfer and the control switch fabric comprises an Ethernet switch for control information transfer (Muller, col. 4, lines 1-23).

10. As per claims 7,50 Blumenau -Muller disclosed further comprising a resource module connected to the plurality of storage devices for generating pre-allocation information that pre-allocates storage from the plurality of storage devices in order to evenly distribute a workload 4 across the plurality of storage devices (Blumenau, col. 2, lines 5-21).

11. As per claims 8,51 Blumenau -Muller disclosed wherein the switch fabric connects the access interface module to the resource module so that the resource module can transfer the pre-allocation information to the access interface module (Muller, col. 4, lines 44-57).

12. As per claims 9,52 Blumenau -Muller disclosed wherein the access interface module selects a subset of the plurality of storage devices based on the pre-allocation information (Blumenau, col. 2, lines 5-21).

13. As per claims 10,53 Blumenau -Muller disclosed wherein the access interface module comprises a data memory which temporarily stores information transferred between the access interface module and the selected subset of the plurality of storage devices (Blumenau, col. 5, lines 49-57).

14. As per claims 11,54 Blumenau -Muller disclosed further comprising a plurality of access interface modules each access interface module receiving storage requests from a plurality of clients (Muller, col. 5, lines 6-19).

15. **Examiner's notes:** Examiner has cited particular columns and line numbers in the reference(s) applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner. In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and also to verify and ascertain the metes and bounds of the claimed invention

Response to Arguments

16. Applicant's arguments filed 03/01/2010 have been fully considered but they are not persuasive. Response to applicant's argument is as follows.

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A. Applicant argued that prior art did not disclose, "The data to which the requests refer could be stored in different storage devices based on load balancing considerations".

As to applicant's argument Blumenau disclosed,

In accordance with a final aspect of the invention, there is provided a storage network including a cached storage subsystem and a switch. The cached storage subsystem includes a plurality of storage devices, a cache memory linked to the storage devices for filling the cache with data from the storage devices, and a plurality of port adapters (Col. 2, lines 62-67)

providing storage ports for access to the cache memory. The switch has a plurality of inputs for receiving data access requests from a plurality of hosts, and a plurality of outputs linked to the storage ports for selectively routing data access requests from the inputs of the switch to the storage ports. 5
The storage network further includes a memory containing routing information. The routing information defines respective outputs of the switch to which storage access requests received at the inputs of the switch should be routed. The switch is programmed to respond to receipt of the storage 10 access requests at the inputs of the switch by routing each storage access request received at each input of the switch to a selected output of the switch by accessing the routing information in the memory to select an output of the switch to which the each storage access request should be routed, 15 and to route the storage access request to the selected output of the switch to which the storage access request should be routed. The storage network further includes a processor programmed to change the routing information in the memory based on loading characteristics of the storage 20 access requests.

(col. 3, lines 1-22).

B. Applicant argued that prior art did not disclose that data at an input node could be directed to different output nodes based on criteria other than the data address, such as load balancing considerations.

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As to applicant's argument Blumenau disclosed,

The likelihood of storage port overload preventing a host from obtaining immediate access to storage in the cached storage subsystem can be reduced still further if not all of the 60 hosts have access to all of the storage ports, so long as this reduction in access is based on balancing of the loading characteristics of the hosts. This is especially true if it is desired to permit some of the hosts to have priority over others, so that under high loading conditions, the higher 65 priority hosts can continue to have immediate access at the expense of the lower priority hosts which are denied imme- (col. 5, lines 58-67)

mediate access. The introduction of load balancing into a data processing system as shown in FIG. 2, however, typically involves a good deal of complexity, especially if the load balancing is performed dynamically to track highly variable loading characteristics of the hosts. (col. 6, lines 1-5)

C. Applicant argued that prior art did not claim how the data arrives there but how the data is stored.

As to applicant's argument Blumenau disclosed,

loop ports 42 of the switch 40. The dynamic balancing facility adjusts the list of storage subsystem ports for each loop port based on the frequency of data packets received from and transmitted to each of the loop ports and a priority level assigned to each of the loops, in order to dynamically balance the loading of the data packets upon the storage ports.

(col. 6, lines 46-53).

Conclusion

17. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

18. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Adnan Mirza whose telephone number is (571)-272-3885.

19. The examiner can normally be reached on Monday to Friday during normal business hours. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivek Srivastava can be reached on (571)-272-7304. The fax for this group is (703)-746-7239. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

20. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at (866)-217-9197 (toll-free).

/Adnan M Mirza/
Examiner, Art Unit 2445

/VIVEK SRIVASTAVA/
Supervisory Patent Examiner, Art Unit 2445